Fire risk report for *Acacia robusta subsp. clavigera*

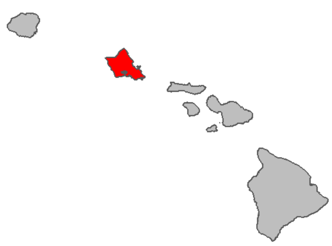
Full Species Name
Acacia robusta subsp. clavigera Burchell

Family: Fabaceae

Common names:
Splendid thorn

Synonyms:
Vachellia robusta

Known occurrences (as of 2020)



Year first documented as naturalized in Hawai'i: 2012

This species has been ranked by the Hawai'i Weed Risk Assessment program as High Risk with a score of 7.

View photos on Starr Environmental

View on Wikipedia

View occurrences on iNaturalist

View at Plants of Hawaii

View photos on Flickr

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Lowest risk ⇔ Highest risk

This species is likely a **low** fire risk in Hawai'i with a fire risk score of **0.22**.

This species was ranked by our machine learning algorithm using the data presented on the next page. A predicted score of > .34 suggests the plant is a high fire risk.

Summary of Fire ecology	
Native habitat fire proneness	Fire-prone
Fire promoting plant in its native range	No
Fire promoting plant in its introduced range*	No
Regenerates after fire	Yes
Promoted by fire	No Data
Reported flammable*	No Data
Relative is flammable*	Yes

*These values were used by the model to predict fire risk

Detailed summary of Fire Ecology

Native habitat fire proneness (In any part of the plant's native range is its habitat described as fire prone due to natural or human caused fires?)	Fire-prone	"The species occurs in a diverse range of habitats and is component of many plant communities. The species is commonly found in open forests and woodlands, often near streams, where one can find large specimens. In southern Africa, it is very common in the warm dry savannas, up to 1,800 m altitude." #Savannahs are typically fire prone https://doi.org/10.17707/AgricultForest.66.1.15 Botumile, Amantle, Demel Teketay, Witness Mojeremane, and Thembinkosi Mathowa. "Overcoming Seed Dormancy of Senegalia Galpinii and Vachellia Robusta through Scarification Pre-Sowing Treatments." Agriculture & Forestry 66, no. 1 (2020): 153–69. ---------------------------- "native range is Ethiopia to S. Africa." http://www.plantsoftheworldonline.org/taxon/urn:lsid:ipni.org:names:77131776-1 ---------------------------- "The sites were representative of the major Acacia-dominated habitats 127 of Serengeti. Our study utilized the 19 plots (2 plots in each of nine sites and one NCA 128 plot) that were protected from fire. " #sites wouldn't have to be protected from fire if the habitat wasn't fire prone https://eprints.gla.ac.uk/143648/1/143648.pdf Rugemalila, D. M., Morrison, T., Anderson, T. M., & Holdo, R. M. (2017). Seed production, infestation, and viability in Acacia tortilis (synonym: Vachellia tortilis) and Acacia robusta (synonym: Vachellia robusta) across the Serengeti rainfall gradient. Plant Ecology, 218(8), 909-922. ---------------------------- "The sites were originally selected to span the rainfall gradient and to represent the major woodland savanna habitat dominated by A. tortilis and A. robusta throughout the ecosystem (Holdo et al. 2014). Half of the plots have been protected from fire, while the remaining half subjected to annual burn treatments" https://mospace.umsystem.edu/xmlui/bitstream/handle/10355/47039/research.pdf?sequence=2

		Rugemalila, D. (2015). Drivers of tree community composition and seed demography in Serengeti National Park-Tanzania (Doctoral dissertation, University of Missouri--Columbia).
Fire promoting plant in its native range (Does the species act as a major fuel source, increase fire severity, frequency, or modify fuel bed characteristics within its native range?)	No	
Fire promoting plant in its introduced range (Same as Fire Promoting Native but within the species introduced range)	No	
Regenerates after fire (Does the plant regrow after fire by any means? This includes resprouters, reseeders, and recruiters which dispersed into the area within approximately one year post fire)	Yes	"The sites were originally selected to span the rainfall gradient and to represent the major woodland savanna habitat dominated by A. tortilis and A. robusta throughout the ecosystem (Holdo et al. 2014). Half of the plots have been protected from fire, while the remaining half subjected to annual burn treatments" #must regenerate if persisting in annually burned system https://mospace.umsystem.edu/xmlui/bitstream/handle/10355/47039/research.pdf?sequence=2 Rugemalila, D. (2015). Drivers of tree community composition and seed demography in Serengeti National Park-Tanzania (Doctoral dissertation, University of Missouri--Columbia).
Promoted by fire (Does the plant increase in abundance after a fire?)	No Data	
Reported flammable (Is the species described as being flammable, being a major wildfire fuel, or high fire risk?)	No Data	
Relative is flammable (Does a plant in the	Yes	"[Acacia melanoxylon reported as a fire hazard]" https://firesafemarin.org/plants/fire-hazardous

same genus meet the Reported Flammable criteria?)		---------------------------- "However, since flammability and fire severity are also elevated due to invasion by Acacia spp." Rascher, Katherine G., André Große-Stoltenberg, Cristina Máguas, Joao Augusto Alves Meira-Neto, and Christiane Werner. Acacia longifolia invasion impacts vegetation structure and regeneration dynamics in open dunes and pine forests. Biological Invasions 13, no. 5 (2011): 1099-1113.)

Text in quotes are direct quotes from the source
Text in square brackets was added by the assessor to clarify something or to summarize from a figure.
Text preceded by a "#" is comment from the assessor

The data presented were assembled from literature and database searches for each species using as much data as could be collected regarding the plant's fire ecology under natural conditions. Searches aimed to be exhaustive and consist of as much data as could be located in 2020. Our machine learning algorithm was trained on 49 species of plants which had their fire risk ranked by 49 managers in Hawai'i in November 2020. The model used a conditional random forest regression algorithm to predict scores for each species using the manager score as the response variable and the fire ecology traits of each plant as the predictor variables to generate a fire risk score. This trained model was then used to predict the fire risk for all species which were not ranked by managers. The model was calibrated such that it is 90% accurate at predicting high fire risk plants and 79% accurate at predicting low fire risk plants. This research and the resulting fire risk model has been published in the journal Biological Invasions by Kevin Faccenda and Curt Daehler (both at the University of Hawaiʻi at Mānoa).

Note that the analysis doesn't account for a plant species' spatial distribution, population density, or distinct climate and ecosystem conditions (which can also influence fire risk). The fire risk of these species are mostly under "worst case" environmental conditions where the climate is dry enough to maintain fire, but wet enough to allow for plant growth and fuel accumulation. The fire risk ranking should not be taken as a stand-alone risk metric in prioritizing weed control efforts. Rather, this information may also be useful for determining if a newly discovered species poses a potential fire threat in wildland areas.

More general information on the weed risks and ecology of non-native plants in Hawaiʻi is available from the Hawaiʻi Invasive Species Committee's Weed Risk Assessment database.

View more fact sheets at https://www.pacificfireexchange.org/weed-fire-risk-assessments

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Fact sheet prepared by Kevin Faccenda (faccenda@hawaii.edu) in November 2021. Data were prepared by Ronja Steinbach and Kevin Faccenda in 2020.

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